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INDUSTRIAL AND LABOR CONDITIONS IN NORTHEAST CHINA, 1949

[Comment: This report summarizes information on industry and labor from an account of a visit to six industrial centers of the Northeast (not including Mukden) in the fall of 1949, shortly after the reconstruction of the economy of the Northeast was undertaken by the Chinese Communist regime. The author, Li Lien, was one of a sight-seeing party of 40 industrialists and businessmen of Nanking who visited the Northeast. Much of the material appeared originally in the Nanking Hsin-hua Jih-pao, and was later edited and published by the Hsin-hua Shu-tien, in Peiping, October 1950, under the title Tung-pei Fang-wen Chi (A Travelogue of the Northeast).]

DAIREN

Exhibits

At the great Dairen Industrial Exposition, the Dairen Steel Plant exhibited some excellent manganese steel castings which are able to withstand temperatures of over 450 degrees centigrade. This plant is noted for its production of hard steel alloys (some of which have a hardness only 5 percent less than that of diamond drills), special steels, and high-speed steels.

The Dairen Shipbuilding Works exhibited a 120-horsepower marine diesel engine for installation in 50-ton fishing craft that have the speed, stability, and seaworthiness of the best foreign-built fishing craft. The Dairen Shipbuilding Works also exhibited large brass propellers, boilers, crankshafts, expansion rings, connecting rods, steering gears, steam cylinders, 20-meter long cast-steel anchor chains weighing over 1,000 kilograms, and other parts and equipment used in shipbuilding.

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In other sections, there were shown 5-ton steam winches, water pipes that were 4.14 meters long and 63.4 centimeters in diameter, 15-ton cranes, 25-kilogram steam gauges made by the students of the technical training school conducted by the Chinese Ch'ang-ch'un Railway Shops, chilled cast-steel car wheels, 3-way valves, injectors, oil and water pumps, beltless lathes, micrometer gauges, mining equipment, bridge-erecting machines, ore-selecting machines, ore stamps, oil and water hydraulic presses, Lancashire boilers, electric motors, radio receivers and transmitters, radiophones, 75,000-volt high-pressure insulators, 50,000-volt communications insulators, chemical apparatus illustrating the production of sulfuric, nitric, and hydrochloric acids, dihydroxynaphthalene /?/ ether, coal gas producer and gas appliances, ammonia gas compressor, marine and agricultural products, and educational equipment such as models, diagrams, statistical charts, and books.

Industrial Plants

Apart from the exposition, visits were made to the following establishments: the Chinese Ch'ang-ch'un Railway Shops, the Kuang-ho Machine Shop, the Dairen Machine Shop, the Dairen Steel and Iron Works, the Far East Electric and Development Company's Metalworking Shop, the Porcelain Insulator Factory, the Electric Bulb Factory, the Soda Works, the Dairen Shipbuilding and Repair Works, the Electric Light and Power Generating Plant, the Electricity Bureau, the Motor Repair Shop of the transportation company, the Dairen Chemical Works, the Electrochemical Works, the Kuang-hua Electrical Factory, the Kuang-yuan Oil and Crease Factory, the Dairen Telephone Office, and the Glass Food Utensils Factory.

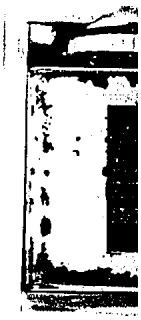
Hsieh Wei-chieh, chief technician of the Yung-li Company's Ammonium Sulfate Plant at Nanking, at the invitation of the Dairen Chemical Works, participated in a conference of managers and foremen and was persuaded to remain over for a period to assist them in the enlargement of their plant. The leader of our delegation, Ts'ai Ch'ang-feng, and a few others, met in consultation with the Planning Committee of the administrative office of the city of Dairen concerning the exchange of products between the Northeast and Central China. For example: Dairen industries need iron sulfide which is available at the Ma-an-shan iron mine near Nanking, and Nanking needs special kinds of steel and machine parts. Dairen has these special steels and produces a great variety of machine parts. Thus, these ores and manufactured articles may be exchanged with mutual advantage.

Since reconstruction began in Dairen, progress has been quite rapid. During the period of Japanese domination previous to 1945, the Dairen Cotton Mill and the Chin-hsien Cotton Mill had only 72,282 spindles, and now /October 1949/ there are 108,447 spindles. Formerly, only No 20 yarn was made; now, No 40 and No 50 yarn are being produced, and shirts, socks, and cloth are being woven. Formerly, the Dairen Shipbuilding Works built ships of not over 5,000 tons; now, they are able to build 10,000-ton ships.

For about 2 years following V-J Day in 1945, industry in Dairen was practically paralyzed and wages were extremely low. Wages had to be raised to be come living wages. However, it was soon realized that it would be a mistake to raise wages unless production was also increased. In July 1949, the old 22-grade wage scale was abandoned and the new seven-grade wage scale was adopted in all publicly operated industrial enterprises. There was a marked increase in production. By October 1949, the Dairen Cotton Mill had surpassed the 1948 target by 20 percent, and the Glassworks was far ahead of the production goal.

Currency

Some time after V-J Day, the currency in Dairen underwent two important changes. To avert the calamity which the KMT sought to bring about by dumping in Dairen all of the Soviet Army notes they could get their hands on, a stamp,



like a revenue stamp, of equal value, was affixed to those notes actually in circulation in Dairen, and the use of notes without the stamps was prohibited. The other change was to replace the old Nationalist notes with new ones known as "Kuantung pi" /currency for circulation in the former Kuantung Leased Territory/. The value of one yuan /Kuantung pi/ in 1949 was equivalent to that of 2.7 yuan (jen-min p'iao; that is, notes of the Central People's Government then in circulation south of the Great Wall). /The circulation of Kuantung pi was discontinued in June 1950 in favor of Tung-pei p'iao (Northeast notes) at the rate of 1 to 270. Still later, in April 1951, the Tung-pei p'iao were retired in favor of the jen-min p'iao at the rate of 9.5 to one. -- Ching-chi Chou-pao (Economic Weekly) No 5, 7 Feb 1952/

The Seven-Grade Wage Scale

From V-J Day, 15 August 1945, until July 1949, there were two dissimilar wage systems in use in the industries of Dairen. One of them aimed merely to provide a living for the workman, and started with what was required for the sustenance of one and one-half persons. It increased by many stages and small increments, and yet there was not much difference between what a skillful workman earned as compared with what an inferior workman earned. As a result, there was little inducement for the latter to make the extra effort to become a superior workman. This situation had an adverse effect upon industrial production.

The other system aimed at increasing productivity as well as at a better living for the workman and his family. It was based on the principle of more pay for more work, in other words, compensation according to performance. These aims were embodied in the Seven-Grade Wage Scale, which was the basis of the Cumulative Reward Wage System, the Piecework Wage System, and the Mixed Wage System, combination of the piecework system and the timework system.

In the Seven-Grade Wage Scale, the wage for Grade 1 was set at 2,400 yuan per month, the amount deemed sufficient to support a single worker at 1946 prices. /throughout this article, the term yuan is to be taken as referring to Kuantung pi, unless the unit is otherwise specified./ The wages for the other grades up to Grade 7, the highest for workers other than staff employees, were increased step by step based on the experience and advice of the Soviet advisors. The increments from one grade to another were not all uniform, nor was the increase of the increment uniform. In fact, the idea of uniform increment was entirely abandoned, and the higher a man advanced in skill and competency, the greater the rate of increase of pay from one grade to the next grade. This was intended to stimulate and encourage the workers to strive for greater proficiency and productivity.

The following tables give the actual figures, in yuan, of the Seven-Grade Wage Scale, and related matters, in effect in 1949 at the Far East Electric and Development Company's Glassworks in Dairen; and this scale is the same as that in effect in other Sino-Soviet enterprises in the Northeast.

Seven-Grade Wage Scale

Workmen	Percent Workers by Grades	Grades	Monthly Wages	Percent of Grade 1 Wage	Wage Increment Between Grades	Percent Increment Between Grades
Men in training	1.1	1	2,400	100	--	100
		2	2,880	120	480	120

Workmen	Percent Workers by Grades	Grades	Monthly Wages	Percent of Grade 1 Wage	Wage Increment Between Grades	Percent Increment Between Grades
Ordinary journeymen	31.4	3	3,480	145	600	125
		4	4,200	175	720	130 [sic]
Skilled workmen	67.5	5	5,160	215	960	133.5
		6	6,240	260	1,080	112.5
		7	7,680	320	1,440	133.5

In the Seven-Grade Wage Scale, the classification of workers is as follows:

Grades 1 and 2: Apprentices.

Grade 3: A worker who can understand simple blueprints of machine parts, make simple calculations, sharpen and use tools, and do independent work in general.

Grade 4: One who can read blueprints for a portion of planned installations, can operate lathes, drills, planers, and buffers, make ordinary calculations, and do comparatively more complicated work.

Grade 5: One who understands complicated installation blueprints, can make any kind of necessary calculations, is expert in some particular line, is a rapid worker able to produce very good quality work, and understands work symbols.

Grade 6: One who understands simple diagrams and rough sketches, understands the structure of mechanisms, who is expert in the operation of two or three kinds of machine tools, is able to make inspections of machine repairs, and understands the properties of iron and steel.

Grade 7: One who is competent to handle the detailed plans for a complete installation or project, is able to make rough drawings, understands the structure of comparatively intricate mechanisms, is a skilled operator of machine tools, is accurate in his calculations, is able to formulate plans for carrying out all sorts of work, and knows the properties of all the common metals.

An auxiliary to the Seven-Grade Wage Scale is an arrangement by which the company will sell to its workers at low prices limited rations of such supplies as corn meal, bean oil, meat, white flour, sugar, soap, and salt. The size of the rations in kilograms and their values in terms of yuan, and the savings realized by the workmen, are shown in the following table.

Table 1. Workmen's Rations

	For the Workman Himself					For the Family of Workmen		
	Unit Prices (yuan)		Quantity	Total Value (yuan)		Quantity	Total Value (yuan)	
Article	Ration	Market	(kg)	Ration	Market	(kg)	Ration	Market
Corn meal	23	40	16	368	640	9	207	360
Savings		17			272			153

Table 2. Workmen's Rations

Article	For the Workman Himself: Unit Prices (yuan) Ration	Market	Quantity (kg)	Total Value (yuan) Ration	Market	For the Family of Workmen: Quantity (kg)	Total Value (yuan) Ration	Market
Bean oil	171	260	0.4	68.40	140.00	0.3	51.30	78.00
Sugar	108	400	0.4	43.20	260.00	0.3	32.40	120.00
Tea	831	831	0.05	41.55	41.55	0.25	20.78	20.78
Total				153.15	305.55		104.48	218.78
Savings					152.40			114.30

Table 3. Rations, Costs, and Savings to Workers Under the Seven-Grade Wage Scale

Article	Grade 7 Skilled Workmen and Foremen: Unit Prices (yuan) Ration	Market	Quantity (kg)	Total Value (yuan) Ration	Market	Grades 1 to 6 Workmen: Quantity (kg)	Total Value (yuan) Ration	Market
Corn meal	35	40	6.0	210	240	4.0	140	160
Bean oil	130	260	0.5	65	130	0.5	65	130
Meat	170	400	2.0	340	800	1.0	170	400
Flour	130	220	2.0	260	440	--	--	--
Sugar	170	400	0.5	85	200	--	--	--
Soap	270	300	1.0	270	300	1.0	270	300
Salt	45	45	2.0	90	90	--	--	--
Total				1,320	2,200		645	990
Savings					880			345

The above tables show that the workers are really taking home some supplementary wages in the form of savings in the cost of food. It also appears that the Grade 7 workmen realize 535 yuan more in savings than the lower grade workmen.

The Glassworks operate a dining room where the workers can get a meal at low prices. In this way, a man may save as much as 260 yuan a month. The savings are the results of getting a corn meal dinner for 20 yuan instead of for the market price of 30 yuan.

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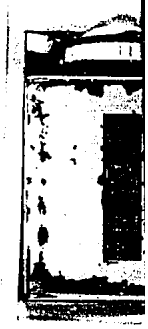


Table 4. Fourteen-Grade Salary Scale for Staff Employees at the Glassworks

Classification and Percentages of Total Payroll		Grade	Salary in Yuan
Management and supervisory	1.0%	14	16,000
		13	15,000
		12	14,000
		11	13,000
Technicians	5.0%	10	12,000
		9	11,000
		8	10,000
		7	9,000
Clerical	3.6%	6	8,000
		5	7,000
		4	6,000
		3	5,000
Servants	2.4%	2	4,000
		1	3,000

The spread between the grades of the four main classifications indicates the inducements offered to those in lower grades to strive for advancement to higher grades. It was learned that in certain other Dairen industrial concerns there were altogether 15 grades of staff employees; the lowest grade salary was 3,500 yuan in heavy industries and 3,200 yuan in light industries. In a heavy industry, the salary for Grade 15 was 17,000 yuan, and in light industry 15,000 yuan. The staff employees also have the right to purchase ordinary rations and special rations from the company at low prices; but the quantity standards for themselves are about 10 percent less than for workmen, but rations for their families are the same as for the families of workmen.

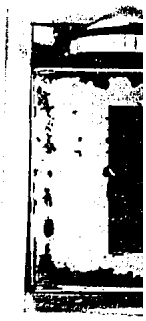
The standards for special rations are as follows:

Rice: the ration for the superintendent of works is 25 kilograms; for engineers and section chiefs, 15 kilograms; for shop foremen, accountants, and estimators, 10 kilograms; for technicians and gang foremen and clerical staff members of Grade 7 and above, 5 kilograms. Those who receive rice have their corn meal ration reduced proportionately.

In the specific application of the Seven-Grade and Fourteen-Grade Wage and Salary Scales listed above, the following points should be noted: they apply only to those who are working on a time basis, not on a piecework basis. At the Glassworks in 1949, there were 227.6 working days, calculated thus:

From 365 days, deduct 60 days spent in the repair of the main furnace, 40 week-end rest days, 7 festival days, 7.7 special holidays, 10.2 days of sick leave, and 11.5 special nonworking days, which should give 227.6 [sic] working days. Ordinary factories do not have to shut down for the repair of the furnace, hence the number of working days in a year would be 227.6 plus 60 minus 5 week-end rest days, which makes 282.6 days. Special holidays refer to public holidays and anniversary celebrations.

With respect to the privilege of buying rations at reduced prices, at the Dairen Shipyards, if a worker works 25 or more days per month he may buy his full quota of rations. For each day less than 25, his quota is reduced by a 25th; but if a man works less than 19 days in a month, he loses his privilege entirely.



More and more attention is being paid in Dairen to the welfare of the workers. The Sino-Soviet enterprises all adhere to the rule that the company will meet all the medical expenses incurred due to accidents sustained in the course of a man's work. In cases of sickness where the company approves hospitalization, the company will meet the hospital fees, medical care and medicines, and continue the man's pay. If members of a workman's family have to go to the outpatient clinic for treatment of sickness, they may enjoy reduced rate privileges. When the family is very poor, then, with the consent of the company, further reductions or even total exemption from charges may be secured.

Cumulative Reward Wage System

After the workers' political consciousness had been raised, it was frequently found that a piece of work, for which the standard allotment of time was 8 hours, could be completed in 4 hours or even 2 hours. This occasional above-average or above-quota production could also be induced by special patriotic appeals or challenges to competition with the award of banners or certificates of merit to individual workmen, gangs, or factories. However, experience showed that some material reward was necessary for sustained high production, and to meet this requirement, the cumulative reward wage system was adopted. This system was based on the principle of "more pay for more work," or, that "compensation should be determined according to the work done."

The adoption of this system resulted in greatly raising the production rate, effecting economy of time, materials, and fuel, and in substantially reducing the costs of production, all of which was of great advantage to the factory. The successful implementation of this system involves the adoption of correct production plans and of correct work quotas. The Far East Electrical and Development Company's Glassworks found that the following five fundamental conditions were essential.

1. The factory should have proper equipment, maintained in good operating condition.

2. The factory should have an adequate and competent working force and satisfactory operating technics.

3. A sufficient and steady supply of raw materials to prevent interruptions due to shortages.

4. A simple line of standardized products. If the products are of great variety, it is then imperative that there be skillful management and a highly efficient system of cost accounting.

5. When the foregoing four conditions are assured, then a definite production plan must be formulated, taking into consideration the quality, time required, the quantity, and the value of the product.

The setting of the work quota should be based not on the capacity of a few of the best workmen, nor on that of the poorest, but rather on that of the average workman, or on the average of a large number of workers.

The following table shows how, in the Glassworks at Dairen, the credit for above-quota production is distributed to the workmen on basic production and to those on accessory work.

Table 5. Distribution of Credit for Above-Quota Production

Degree of Above-Quota Production (%)	Credit to Basic Workers (%)	Credit to Accessory Workers (%)
105	110	105
110	115	110
115	120	115
120	125	117
125	130	120
135	140	130
150	150	135
160	160	140
175	200	170

The assistant superintendent of the Glassworks explained that if a workman, or group of workmen, was able to produce more than 175 percent of the quota, that fact indicates that the quota should be questioned. In the Glassworks, basic workers include those who mix the raw materials, charge the furnaces or kilns, operate the machinery that produces sheet glass, the cutters that cut the sheets to standard sizes, and the packers. The accessory workers are the machinists, carpenters, electricians, unskilled laborers, etc. /It should be recognized that although a machinist may be an accessory worker in a glassworks, he might be a basic worker in a machine shop producing machinery./

Reward for above-quota production is applicable to the individaul workers, to a group large or small, even to a whole process or a whole factory. To illustrate the application of the preceding table to an individual basic worker, take the case of Yang, a cutter in the Glassworks. Yang usually is able to perform his particular task on 340 square meters of glass per day, whereas the standard quota for this task is 180 square meters per day. His performance then is at the rate of 182.03 percent of the quota /probably should read 188 percent/. Since this rate exceeds the maximum of 175 percent, Worker Yang is entitled to 200 percent of his standard wages.

The average rate of production of the cutters illustrates the application of the table to a group of accessory workers. If the latter rate was 150 percent of the production quota, then the accessory workmen of the cutter process would be entitled to 135 percent of their standard wage. Work targets or quotas must be set for the different divisions or parts of a process or train of processes. In the Glassworks, the work of producing the sheet glass from the molten glass is taken as the standard for determining the production rate. In August 1948, the workmen in this part of the process produced 142 percent of the work quota, and all of the basic workers in this part of the process, in accordance with the table, were entitled to 144.2 percent of their standard wage. Now since the gangs of workmen in the mixing of materials division, and those in the division that charged the furnaces unquestionably did the work that made possible the above-quota performance by the sheet glass producers, their basic workmen were also entitled to 144.2 percent of their standard wages, and their accessory workers to 132 percent of theirs, according to the table.

As to the workmen of other accessory divisions, such as carpenters, blacksmiths, electricians, and so on, their rate of production as a group is based upon the rate of production of finished product accomplished by the cutters,

packed in cases, and delivered to the storehouse. In August 1948, the quantity of finished product was 118.36 percent of the work quota or target; hence the workmen of accessory divisions were entitled to 116.2 percent of their standard wages.

In this connection the following should be noted. The staff employees of the grade of technical cadres and above are entitled to the same percentage of additional reward as the /basic/ workmen are given up to 140 percent of the target. For any increase in production of 141 percent or more, they are entitled to 170 percent of their standard salaries, and that is the maximum that they may receive. The reason for the big jump to 170 percent is that increase of production above 140 percent presumably can only be effected by some marked technological improvement in process or equipment for which the higher rank cadres and officers are chiefly responsible, rather than the workmen.

For instance, in September 1948, the introduction of 2 percent of fluorspar in the mixture of raw materials led to a 5 percent increase in the production of molten glass with the same amount of fuel. Also, an improvement in the sheet-forming machinery did away with the production of much imperfect sheet glass which had to be rejected. If the factory should have to shut down operations for reasons not attributable to the workers, wages are paid to the workmen at 100 percent of the standard wage prescribed by the Seven-Grade Wage Scale.

Because of the improved feelings and attitudes of the workers attributable to the cumulative reward wage system, the rate of output in industries generally has been increased. For this reason it is only right that every quarter, the production quotas or targets should be revised and raised; but the rise should not be more than 10 percent in any one quarter. If mechanical or technical improvements make possible a marked increase in production, that is additional justification for the upward revision of the work quotas or targets. Another very important matter is to stiffen inspection standards and guard against deflections, bias, or favoritism, and so safeguard the quality of products.

Piecework Wage System

The piecework wage system is the best way to assure fair compensation in proportion to work done. It should be pointed out, however, that the piecework wage system that the Chinese Communists use is not the same as the contract system adopted by the capitalist system. The contract system squeezes more work out of the worker with no increase in compensation; it is a harsh domineering method by which the capitalists exploit the workers. Our piecework system enables the worker to earn more pay by doing more work. The matter of prime consideration in the piecework system is to set the rate of compensation at the optimum point, all things considered. The piecework rate for a given article or piece of work is determined by finding the average day's wage based on a 26th of what the wages would be for a normal month according to the Seven-Grade Wage Scale on a time basis, and divide this average daily wage by the average number of pieces of work that can be completed satisfactorily in a normal working day. However, to embody a real inducement to higher production, the normal month's wage for the worker in question should be increased 10 percent before making the above calculations. The following table illustrates the method of calculation of piecework pay rates used in the Glassworks.

Table 6. Specimen Piecework Pay Rate Computation

Items	Grade 6 Worker (yuan)	Grade 7 Worker (yuan)
Normal monthly wage, on time basis	6,240	7,680
10 percent increase	624	768
Augmented monthly wage	6,864	8,448
Augmented average daily wage	269.18	331.29
One working day's piece quota	280	280
Piecework pay rate per square meter	0.96	1.18

REMARKS: When a workman has completed his work on 280 square meters of sheet glass, he has completed a normal day's work and is entitled to his base pay for the day; any satisfactory accomplishment of more than 280 square meters would entitle him to a proportional increase in pay at the rate of 0.96 yuan per square meter for the Grade 6 workman, and the rate of 1.18 yuan per square meter for the Grade 7 workman.

HARBIN

Harbin is a light industry city. Prior to 1931, because of the Chinese Eastern Railway, a number of industries produced supplies for the railway. Under the 14 years of Japanese domination, besides producing supplies for the Japanese and puppet military establishments, many industries were engaged in processing raw materials and producing light consumer goods. The city was chiefly a distribution center for goods of local and foreign origin. In 1931, there was one factory called the T'ung-chi Factory with 2,300 employees, but in 1945 there were only three men, the proprietor and two workmen. Only about 4,000 business concerns remained in the whole city.

On 28 August 1948, the Chinese Communists took over from the Nationalists and began rebuilding and expansion. One industrialist, named Sun Ju-te, undertook the establishment of the Yuan-tung Tannery. By October 1949, he had, in addition, successfully established a chemical factory and a machine-operated bleaching and dye works. In little more than a year, the total number of business concerns had increased to over 23,000. Instead of military supplies, the city began to produce and to distribute agricultural implements, the tools of peace.

In the Harbin Prison workshop, where there were some 1,6000 prisoners, over 900 were engaged in making blankets, towels, ironware, socks, cloth, horsehair, and hog bristle brushes, and other goods. The workshop made 17,500 uniforms for the army. It not only taught men trades, but also served as an employment agency for discharged prisoners.

KIRIN

The Sungari River flows around the east and south sides of the city; hills are on the west and north sides. The Japanese built the industrial section in North Kirin. Among the factories visited were the cement works, the chemical works, the Yung-chi Paper Mill, a hemp factory, and the famous Feng-man Hydro-electric Generating Plant. The chemical works used to produce artifical gasoline from oil shale and other valuable oils, but following V-J Day the Japanese puppets and the Nationalists /sic/ stripped it until practically nothing was left. The part of the works producing phosphorus has now been restored to supply the need for making matches. Other parts of the chemical works are in process of restoration.

The hemp factory was originally built by the Japanese in 1939 to spin hemp for canvas production. In 1944, a shop was begun to make bags with fabric similar to woven hose-pipe fabric, but this shop was not completed until after V-J Day in 1945. In 1946, the Chinese Communists got production under way at the rate of 60 kilograms of yarn per day. This was broken up by the Nationalists, and the shop was reactivated in March 1948. Now, in 1949, there are nine machines weaving the fabric for making bags, and these machines are able to produce 250 meters per day. Twenty looms produce over 20 bolts of waterproof canvas per day. Hemp canvas is impervious to water for as long as 6-7 hours.

The paper mill was established by the Japanese in 1941. Originally, it had six long web machines and one round web machine. Previous to 1945, this factory manufactured banknote paper, newsprint, wrapping paper, thin writing paper for use in making several copies at one time, photographic paper, and looseleaf paper. At that time there were 316 employees. Under Nationalist operation, the number of employees dropped to 160, and the output to 49 reams a day. Work under the Communists was resumed in October 1949, with five more machines installed. The daily output at that time was 6 tons of newsprint, 3 tons of stationery paper, 5 tons of wrapping paper, and some banknote paper. An additional building, to be completed in December 1949, will have two large machines, one of which can produce paper 120 inches wide at the rate of 15 tons of paper per day. Then there will be nine machines in simultaneous operation. This factory has to depend on An-tung for its pulp. According to the factory's plans, in 1950, a pulp mill is to be constructed which will solve the raw material problem, reduce costs, and improve the quality of the product. At present, there are 900 workers employed in this paper mill.

CH'ANG-CH'UN

In Ch'ang-ch'un, former capital of the defunct Manchukuo regime, the party visited the Northeastern Bank, the Northeast Scientific Research Institute, the old Imperial Palace, and some construction work on government buildings. The Northeast Scientific Research Institute was formerly the Japanese Ta-lu /Continental/ Science College, and it had the largest and best equipped laboratories in the Far East. Unfortunately, it was almost completely destroyed. Restoration began almost at once after liberation of Ch'ang-ch'un, and now there are in operation seven research laboratories in the fields of organic chemistry, inorganic chemistry, photochemistry, metallurgy, mechanics, electrical apparatus, and civil engineering and construction. The institute now also has quarters devoted to geological investigation, and several workshops. At the time of our visit, some research workers were making bacteriological cultures, experimenting with the uses of chlorine gas, of sodium sulphate in the manufacture of paper, and with the manufacture of rubber from certain kinds of vegetation. In one of the workshops, glass apparatus for scientific use were being made.

The Northeast Cinema Film Studio has 1,400 employees. It has already produced a number of artistic films and newsreels. It is planned to make in 1950, 45 motion-picture films and an undetermined number of still-picture film strips for educational purposes. In the last year, Ch'ang-ch'un has made great progress. In 1945, it had a population of over 600,000; under the KMT regime, it shrunk to 80,000; but now it is back to 400,000. There are now here 4,600 large and small industrial concerns, and 5,000 commercial concerns. There are many cooperative societies, called producer cooperatives and consumer cooperatives. There are also five state-owned development companies dealing in fuel, grain, native products, general stores, and trust company services. The first three of these purchase the raw materials produced in the rural regions, thus providing a market for the benefit of the country people and for the convenience of the city's industries. The fourth sells the manufactured products of the city for the convenience of the rural population and the benefit of the city workers. The fifth one is like a bridge; it serves both urban and rural communities as financial agent for purchasing and sales; it receives savings on deposit, and makes advances against warehouse receipts. Many of these transactions are made without profit and without interest charges.

FU-SHUN, COAL AND OIL CENTER

Between Ch'ang-ch'un and Mukden, the railway roadbed is wide enough for double tracks. South of T'ieh-ling double tracks are in use; on several sections north of T'ieh-ling, double tracks are being laid. For various purposes in and around Fu-shun, there are an aggregate of 134 kilometers of railway tracks.

The West Open-pit (Hsi-lu-t'ien) Coal Mine at Fu-Shun was visited. To us on the edge, it was like standing on a mountain top and looking down into a deep and immense valley. The sides were terraced at various levels, with narrow gauge railways on them, and one-ton electric shovels constantly scooping up the coal and loading it onto dumpcars which were hauled about by electic locomotives.

The overburden on top of the coal is a layer of yellow earth, and between the seams of coal there are green and brown layers of oil-bearing shale. For every ton of coal taken out, on the average, 3 cubic meters of earth and shale must be removed. Formerly, the Japanese used some of this shale in the process of making soap, but its main value is its use on a large-scale for producing crude oil from which gasoline and other kinds of oil are made. Between 1945 and 1948, under the KMT regime, the removal of earth and shale was neglected, with the result that $2\frac{1}{2}$ million cubic meters of the overburden and the shale collapsed and fell into the pit, and a number of years will be required to get rid of it. Likewise, some 1,200,000 cubic meters of water flooded a portion of the mine and it will take 4 years to pump it out.

After viewing the West Open-pit Mine, while on our way to the Lung-men Mine, there was pointed out to us the prospective site of the East Open-pit (Tung-lu-t'ien) Mine, potentially similar in scale to the West Mine, but which has not yet been exploited. The Lung-feng Mine is of the vertical shaft type, in which an electric elevator is used for both coal and men. The cage has a load capacity of 28 tons, and operates at a speed of 370 meters per minute. Under the guidance of one of the model workers, we were permitted to descend into the mine, a few at a time by a small electric elevator, after putting on miners' clothes, rubber boots, and hat lamps. At the lower end of the shaft, there were electrically operated railway tracks leading along the galleries which were also electrically illuminated.

Of our party, only Hsu Ch'un-fang, engineer of the Ma-an-shan coal mine near Nanking, went to the most distant places where the excavation of coal was actually going on. He reported that the machinery and other equipment in use was of high order. In dangerous places, the galleries were lined with arched reinforced concrete instead of timber. In less risky places steel bracing had been used, and in other places ordinary timber props. The method of back filling is used in this mine to prevent explosions of coal dust and for the protection of the mine and the miners. This is an expensive measure, in which waste crushed shale from the shale oil distillation plant is mixed with seepage water and then packed into the excavated spaces. After this has settled, the water is drained off and pumped to the surface.

In the vicinity of these mines were a number of industrial plants that served and depended mainly upon the mines for their business. Many of them specialized in particular lines. For instance, the steel plant not only produced tool steel, spring steel, and bearing steel, but also hollow-core steel drills for use in the mines. The mechanical and electrical works have very complete equipment for producing all kinds of gears and gear wheels.

At Fu-shun, next to the coal mines, we were most deeply impressed by the size and complexity of the oil-producing plant. This plant extracts crude oil by the dry distillation process from the 5.5 percent oil-bearing shale which is scraped off the underlying open-pit coal mines. It also obtains stibnite (antimony sulfide). The self-dumping cars of broken rock were brought by electric locomotives to the crushers, after which the pulverized material was carried by conveyer belt to the tall round dry distillation furnaces, of which there are 80 each of 100 tons capacity and 60 of 150 tons capacity. These furnaces are able to process 17,000 tons of shale per day. The crude oil then undergoes cracking by means of which is produced gasoline, yellow electrical machine oil, bearing oil, dark gear wheel oil [grease], ordinary black oil [grease?], internal combustion engine fuel, transmission oil, transformer oil, kerosene, safety lamp oil, axle grease, and refined paraffin.

AN-SHAN, STEEL CAPITAL

An-shan is located 60 kilometers south of Mukden. The iron ore reserves near Liao-yang are said to be 600 million tons. In 1918, the South Manchurian Railway Company established the iron and steel works at An-shan. At present, the mining of iron ore is going on at 11 points within a radius of 13 kilometers of An-shan.

We saw the iron blast furnaces, the steel furnaces, the chemical department, the plant where refractory materials are made, and several factories of steel products such as the wire mill, the rolling mills producing plates and rods, and the new type tube mill. In the blast furnaces, gas was being burned to provide hot air for use in the tall iron smelters. The iron smelters had the capacity for melting 400 tons at one charge. Cars passed beneath the furnaces to carry off slag from one tap-hole and molten iron from others. There was an automatic spherical shaped furnace, of 600 tons capacity, for mixing the iron, and connected with the furnace were a number of steel smelters and refineries of horizontal type. These smelters were of 150- or 300-ton capacity, so that if operated at the same time, nearly 1,000 tons of steel could be drawn off in one lot.

Besides the plants already mentioned, there were the following plants, most of which we did not have time to visit: the coke ovens, sulfide of antimony plant, sulfuric acid plant, electrical machinery plant, motor car factory, ball and roller bearing factory, grinding wheel factory, asbestos factory, glass factory, rubber factory, railway shops, cotton mill, and other machine shops.

When passing through Mukden, it was learned that in the Mukden No 1 Machine Shop, there was an engine lathe with a bed 3.8 meters long which was out of commission because it had no tool carriage. Two or three enterprising workmen devised and built a very satisfactory tool carriage and tool holder with the necessary adjustments, after which the lathe was used for doing work on the cylinder for a 2-ton pneumatic hammer. The Mukden No 3 Machine Shop put the collective above-quota reward wage system into operation in September [1948].

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